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PATENT APPLICATION

ATTORNEY DOCKET NO. 10014772-1IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Ming C. Hao et al.

Confirmation No.: 7017

Application No.: 09/982,481

Examiner: Jin Cheng Wang

Filing Date: 10-17-2001

Group Art Unit: 2628

Title: Method for Placement of Data for Visualization of Multidimensional Data Sets Using Multiple Pixel Bar Charts

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PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 11-09-2007.☒ The fee for filing this Appeal Brief is \$510.00 (37 CFR 41.20).☐ No Additional Fee Required.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:☐ 1st Month
\$120☐ 2nd Month
\$460☐ 3rd Month
\$1050☐ 4th Month
\$1640☐ The extension fee has already been filed in this application.☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of \$ 510 . At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees.

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Rev 10/07 (Appl Brief)

Respectfully submitted,

Ming C. Hao et al.

By [Signature]

Dan C. Hu

Attorney/Agent for Applicant(s)

Reg No.: 40,025

Date: January 9, 2008

Telephone: (713) 468-8880, ext. 304

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Applicants:	Ming C. Hao et al.	§	Art Unit:	2628
Serial No.:	09/982,481	§		
Filed:	October 17, 2001	§	Examiner:	Jin Cheng Wang
For:	Method For Placement Of Data For Visualization Of Multidimensional Data Sets Using Multiple Pixel Bar Charts	§ § § § § §	Atty. Dkt. No.:	10014772-1 (HPC.0403US)

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R § 41.37

Sir:

The final rejection of claims 44-48, 50, 53, 54, 56, 59, 60, and 63-90 is hereby appealed.

I. REAL PARTY IN INTEREST

The real party in interest is Hewlett-Packard Development Company, L.P.

II. RELATED APPEALS AND INTERFERENCES

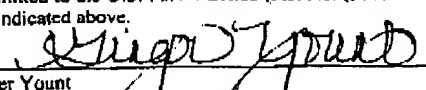
None.

III. STATUS OF THE CLAIMS

Claims 44-48, 50, 53, 54, 56, 59, 60, and 63-90 have been finally rejected and are the subject of this appeal. Claims 1-43, 49, 51, 52, 55, 57, 58, 61, and 62 have been cancelled.

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Ginger Yount	

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IV. STATUS OF AMENDMENTS

An Amendment Under 37 C.F.R. § 1.116 has been submitted to address a claim objection. In the final Office Action, the Examiner objected to claim 90 because its status was not marked. The Amendment Under 37 C.F.R. § 1.116 has provided a listing of claims where the status of each claim has been marked. Since the Amendment was submitted to address a formal issue, entry of the Amendment is proper.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

Independent claim 44 recites a method executed by a computer to form a pixel bar chart for display on a display monitor, comprising:

obtaining (Fig. 1:110) a set of records, each record comprising a plurality of attributes (Spec., 9:18-20);

assigning (Fig. 1:130) a pixel to each of said records to provide record-assigned pixels, wherein every such record-assigned pixel in the chart is assigned to a different record (Spec., 9:13-16); and

constructing the pixel bar chart by:

partitioning (Fig. 2:220) the record-assigned pixels into groups along a first axis of the pixel bar chart according to a first dividing attribute (Spec., 13:1-4);

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partitioning (Fig. 2:230) the record-assigned pixels in the groups into sub-groups along a second axis of the pixel bar chart according to a second dividing attribute (Spec., 13:16-19);

after partitioning into the sub-groups, sorting (Fig. 2:240), in each of the sub-groups, the record-assigned pixels according to a first ordering attribute along the first axis of the pixel bar chart, and according to a second ordering attribute along the second axis of the pixel bar chart, wherein each record-assigned pixel is adjacent at least one other record-assigned pixel (Spec., 14:10-16).

Independent claim 50 recites a computer-readable storage medium having computer-readable program code embodied therein that is adapted to be executed by a computer to implement a method to form a pixel bar chart for display on a display monitor, the method comprising:

obtaining (Fig. 1:110) a set of records, each record comprising a plurality of attributes (Spec., 9:18-20);

assigning (Fig. 1:130) a pixel to each of said records to provide record-assigned pixels, wherein every such record-assigned pixel in the chart is assigned a different record (Spec., 9:13-16); and

constructing the pixel bar chart by:

partitioning (Fig. 2:220) the record-assigned pixels into groups along a first axis of the pixel bar chart according to a first dividing attribute (Spec., 13:1-4);

partitioning (Fig. 2:230) the record-assigned pixels in the groups into sub-groups along a second axis of the pixel bar chart according to a second dividing attribute (Spec., 13:16-19);

after partitioning the record-assigned pixels into the sub-groups, sorting (Fig. 2:240), in each of the sub-groups, the record-assigned pixels according to a first ordering attribute along the first axis, and sorting, within each sub-group, the record-assigned pixels according to a second ordering attribute along a second axis, wherein each record-assigned pixel is adjacent at least one other record-assigned pixel (Spec., 14:10-16).

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Independent claim 56 recites a computer system (Spec., 9:1-4) comprising:

a bus (Spec., 9:1-4);

a display device coupled to said bus (Spec., 9:13-14);

a computer-readable memory coupled to said bus (Spec., 8:21-22); and

a processor coupled to said bus (Spec., 9:1-4), said processor executes a method for constructing a pixel bar chart for display on the display device, said method comprising:

obtaining (Fig. 1:110) a set of records, each record comprising a plurality of attributes (Spec., 9:18-20);

assigning (Fig. 1:130) a pixel to each of said records to provide record-assigned pixels, wherein every such record-assigned pixel in the chart is assigned a different record (Spec., 9:13-16); and

constructing the pixel bar chart by:

partitioning (Fig. 2:220) the record-assigned pixels into groups along a first axis of the pixel bar chart according to a first dividing attribute (Spec., 13:1-4);

partitioning (Fig. 2:230) the record-assigned pixels in the groups into sub-groups along a second axis of the pixel bar chart according to a second dividing attribute (Spec., 13:16-19);

after partitioning (Fig. 2:240) the record-assigned pixels into the sub-groups, sorting, in each of the sub-groups, the record-assigned pixels according to a first ordering attribute along a first axis, and sorting, within each sub-group, the record-assigned pixels according to a second ordering attribute along a second axis, wherein each record-assigned pixel is adjacent at least one other record-assigned pixel (Spec., 14:10-19).

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Independent claim 81 recites a method executed by a computer to form a pixel bar chart for display on a display monitor, comprising

receiving (Fig. 1:110) a set of records, each record comprising a plurality of attributes (Spec., 9:18-20);

assigning (Fig. 1:130) the records to respective data points of the pixel bar chart (Spec., 9:13-16); and

partitioning (Fig. 2:220) the data points into groups along a first axis of the pixel bar chart according to a first dividing attribute (Spec., 13:1-4);

partitioning (Fig. 2:230) the data points in the groups into sub-groups along a second axis of the pixel bar chart according to a second dividing attribute, wherein the sub-groups are arranged in an array defined by the first and second axes (Spec., 13:16-19);

after partitioning into the sub-groups, sorting (Fig. 2:240), in each of the sub-groups, the data points according to a first ordering attribute along the first axis of the pixel bar chart, and according to a second ordering attribute along the second axis of the pixel bar chart (Spec., 14:10-16).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- A. Claims 44-48, 50, 53, 54, 56, 59, 60, And 63-90 Were Rejected Under 35 U.S.C. § 102 As Anticipated By D. Keim Et Al., "Pixel Bar Charts: A New Technique For Visualizing Large Multi-Attribute Data Sets Without Aggregation," HP Technical Report, April 2001 (Keim HP Technical Report).**
- B. Claims 44-48, 50, 53, 54, 56, 59, 60, And 63-90 Were Rejected Under 35 U.S.C. § 102 As Anticipated By M. Ankerst Et Al., "Towards An Effective Cooperation Of The Computer And The User For Classification," Proc. 6th Int. Conf. On Knowledge Discovery And Data Mining (Ankerst).**
- C. Claims 44-48, 50, 53, 54, 56, 59, 60, And 63-82 Were Rejected Under 35 U.S.C. § 102 As Anticipated By M.C. Hao Et Al., "Visual Mining Of E-Customer Behavior Using Pixel Bar Charts," HP Technical Report, June 20, 2001 (Hao HP Technical Reference).**

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VII. ARGUMENT

The claims do not stand or fall together. Instead, Appellant presents separate arguments for various independent and dependent claims. Each of these arguments is separately argued below and presented with separate headings and sub-headings as required by 37 C.F.R. § 41.37(c)(1)(vii).

A. Claims 44-48, 50, 53, 54, 56, 59, 60, And 63-90 Were Rejected Under 35 U.S.C. § 102 As Anticipated By D. Keim Et Al., "Pixel Bar Charts: A New Technique For Visualizing Large Multi-Attribute Data Sets Without Aggregation," HP Technical Report, April 2001 (Keim HP Technical Report).

1. Claims 44-48, 50, 53, 54, 56, 59, 60, 63-90.

All claims were rejected as being anticipated by the Keim HP Technical Report.

To overcome the Keim HP Technical Report as a reference, Appellant had submitted a Declaration Under 37 C.F.R. § 1.132, which was received by the Patent Office on March 20, 2007 (hereinafter, the "Rule 132 Declaration").

The Rule 132 Declaration attributes the content of the Keim HP Technical Report to the Applicant of the present application (Ming C. Hao, Umeshwar Dayal, Meichun Hsu, Daniel A. Keim, Adrian Krug, and Julian Ladisch). The Rule 132 Declaration states that the entire content of the Keim HP Technical Report originated with or was obtained from the Applicant (including inventors Ming C. Hao, Umeshwar Dayal, Meichun Hsu, Daniel A. Keim, Adrian Krug, and Julian Ladisch) of the present application. Rule 132 Declaration, ¶ 3. It was only through oversight of the remaining inventors (Daniel A. Keim, Ming C. Hao, Julian Ladisch, Meichun Hsu, and Umeshwar Dayal) that Adrian Krug was not listed as an author of the Keim HP Technical Report. *Id.* As set forth in M.P.E.P. § 716.10, such attribution of a prior reference to the applicant is sufficient to remove the prior reference (in this case the Keim HP Technical Report) as prior art. See M.P.E.P. § 716.10 (8th ed., Rev. 6), at 700-303.

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The Rule 132 Declaration also states that the authors of the Keim HP Technical Report derived their knowledge of the subject matter described in the Keim HP Technical Report from the Applicant (including inventors Ming C. Hao, Umeshwar Dayal, Meichun Hsu, Daniel A. Keim, Adrian Krug, and Julian Ladisch) of the present application. *Id.*, ¶ 4. As provided by M.P.E.P. § 2132.01, a Rule 132 Declaration that shows derivation of the subject matter of the prior reference from applicant is effective to remove the prior reference as prior art. M.P.E.P. § 2132.01, at 2100-72, 73.

The Rule 132 Declaration also states that the Keim HP Technical Report describes the work of the Applicant (including inventors Ming C. Hao, Umeshwar Dayal, Meichun Hsu, Daniel A. Keim, Adrian Krug, and Julian Ladisch) of the present application. *Id.*, ¶ 5. As provided by M.P.E.P. § 715.01(c), this is sufficient to remove the Keim HP Technical Report as a prior art reference. M.P.E.P. § 715.01(c), at 700-277.

In view of the Rule 132 Declaration, the Keim HP Technical Report has been overcome as a reference, and therefore, the § 102 rejection of the claims over the Keim HP Technical Report should be reversed.

However, the Examiner deemed that the Rule 132 Declaration was insufficient to overcome the rejection based on the Keim HP Technical Report. Appellant respectfully disagrees with the Examiner's position that a Rule 132 declaration cannot be used to overcome the Keim HP Technical Report. The Examiner has not pointed to any rule or law that prohibits the use of a Rule 132 declaration in the present context. In fact, the M.P.E.P., as well as various case law, directly support Appellant's use of the Rule 132 Declaration to overcome the Keim HP Technical Report in the present context.

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The Federal Circuit has made the following statement:

When the joint and sole inventions are related, as they are here, A commonly discloses the invention of A & B in the course of describing his sole invention and when he so describes the *invention* of A & B he is not disclosing “prior art” to the A & B invention, even if he has legal status as “another.”

In re Kaplan, 789 F.2d 1574, 1576, 229 U.S.P.Q. 678 (Fed. Cir. 1986).

In other words, according to the Federal Circuit in *In re Kaplan*, even though a prior reference had fewer authors than the application-at-issue (the prior reference has inventor A, whereas the application has inventors A and B), the Federal Circuit held that the prior reference can be removed as a reference if the prior reference describes the invention of A and B.

The Examiner dismissed Appellant’s citation of *In re Kaplan* based on the Examiner’s contention that the *In re Kaplan* decision was related to an obviousness-type double patenting rejection. 9/5/2007 Office Action at 2. Although the Examiner is correct that the rejection at issue in *In re Kaplan* was an obviousness-type double patenting rejection, it should be noted that the above quoted passage from *In re Kaplan* was provided by the court in *In re Kaplan* in the context of a 35 U.S.C. § 102 analysis. In fact, the court stated that the reference to “another” is “to that word as used in 35 USC § 102(e) and (g).” *In re Kaplan*, 789 F.2d at 1576. Moreover, *In re Kaplan* also agreed with a previous board decision (in the same case as that addressed by *In re Kaplan*), that removed a prior patent (Kaplan patent) as a reference under 35 U.S.C. § 102(e), (g)/103 based on declarations submitted by the appellant of the case in *In re Kaplan*. *Id.* at 1580.

The Federal Circuit in *In re Kaplan* agreed that the prior Kaplan patent was not available to show obviousness of appellant’s claimed invention under § 103. *Id.* Moreover, the Federal Circuit in *In re Kaplan* also rejected the Board’s use of the Kaplan patent to show obviousness in a double patenting context.

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Thus, *In re Kaplan* clearly recognizes that even though a prior reference had fewer authors than the application-at-issue (the prior reference has inventor A, whereas the application has inventors A and B) the prior art reference can be removed as a reference if the prior art reference describes the invention of A and D.

In re Kaplan also cited with approval a C.C.P.A. case: *In re Land & Rogers*, 368 F.2d 866, 151 U.S.P.Q. 621 (C.C.P.A. 1966). In *In re Land & Rogers*, the court stated that “[w]hen the 102(e) reference patentee got knowledge of the applicant’s invention from him, as by being associated with him, or as here, had knowledge of the joint applicants’ invention by being one of them, and thereafter describes it, he necessarily files the application after the applicant’s invention date and the patent as a ‘reference’ does not evidence that the invention, when made, was already known to others.” *In re Land & Rogers*, 368 F.2d at 879. Where inventor A commonly discloses (in an earlier reference) the invention of A and B, “he is not disclosing ‘prior art’ to the A and B invention, even if he has legal status as ‘another’.” *Id.* *In re Land & Rogers* also stated that Rule 131 “is only one way of overcoming a reference.” *Id.* at 878. “Broader” Rule 132 can also be used to overcome a reference. *Id.*

Another case, *In re Blout & Rogers*, 333 F.2d 928, 142 U.S.P.Q. 172 (C.C.P.A. 1964), was cited with approval by *In re Land & Rogers*. *In re Blout & Rogers* held that a Rule 131 declaration submitted (even though inadequate as a Rule 131 declaration), was sufficient as a declaration of facts to establish that a prior Rogers patent did not qualify as prior art under § 102 against a Blout and Rogers application, since the declaration attributed the subject matter in the prior Rogers patent to inventors Blout and Rogers. *In re Blout*, 333 F.2d at 930-31.

Thus, the cases above support Appellant’s use of a Rule 132 declaration in the present context.

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The Examiner goes on to argue that the Rule 132 Declaration is insufficient because the Rule 132 Declaration contains statements that are concerned with the authorship of the Keim HP Technical Report, "as opposed to the inventorship of the claimed subject matter." 9/5/2007 Office Action at 3, 8. The inventorship of the claimed subject matter is irrelevant to the present issue. Appellant has not submitted a Rule 131 declaration to allege an invention date prior to the date of a prior reference. What Appellant has submitted is a Rule 132 Declaration stating that the subject matter disclosed in the Keim HP Technical Report is attributed to Applicant, was derived from Applicant, and describes the work of the Applicant, and therefore, does not constitute prior art against the present application.

Thus, the Examiner's objection to the Rule 132 Declaration that the inventorship of the claimed subject matter is not mentioned in the Rule 132 Declaration is irrelevant to the present issue.

The Examiner also cited to the Hao HP Technical Report as evidencing that Krug "has no possession of the claimed subject matter." *Id.* at 3, 5-6, 7. As will be discussed further below, the Hao HP Technical Report describes a different work made by some of the present inventors and, thus, has no relevance to whether or not Adrian Krug should have been named as an author on the Keim HP Technical Report. Thus, the Examiner's rejection of the Rule 132 Declaration based on the Hao HP Technical Report is improper.

The Examiner also argued that "it is not possible that Adrian Krug has contributed to the entire content of the Keim HP Technical Report" *Id.* at 4. The Examiner argued that if "Adrian Krug had contributed to the entire content of the Keim HP Technical Report, there should be no reason that he would have been excluded as an author for the Keim HP Technical Report and no error should have been occurred on the part of the other Applicants." *Id.*

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The Rule 132 Declaration does not allege that Adrian Krug contributed to the entire content of the Keim HP Technical Report. Rather, the Rule 132 Declaration states that the entire content of the Keim HP Technical Report originated with or was obtained from the Applicant (including inventors Ming C. Hao, Umeshwar Dayal, Meichun Hsu, Daniel A. Keim, Adrian Krug, and Julian Ladisch) of the present application. Rule 132 Declaration, ¶ 3.

The Examiner then argued that the Rule 132 Declaration is vague since the Rule 132 Declaration "does not necessarily mean the entire content of the Keim HP Technical Report originated with or was obtained from Adrian Krug alone. Other Applicant may have contributed to some contents of the Keim HP Technical Report." 9/5/2007 Office Action at 4.

There is no requirement that Appellant must allege that Adrian Krug was the sole contributor to the entirety of the Keim HP Technical Report. The present application is the joint work of the listed inventors. Similarly, the Keim HP Technical Report reflects the joint work of the present inventors. Thus, since the Keim HP Technical Report describes subject that is attributed to Applicant, that is derived from Applicant, and that describes the work of Applicant, the Keim HP Technical Report does not qualify as prior art against the present application.

The Examiner also argued that a Rule 132 declaration can be used to establish inventorship of the claimed subject matter, but cannot be used to establish authorship of a printed publication. *Id.* at 6. Again, it appears that the Examiner has confused the role of a Rule 131 declaration with a Rule 132 declaration. Appellant is not using the Rule 132 Declaration to establish a prior invention of the present application. Instead, Appellant is using the Rule 132 Declaration to establish that the Keim HP Technical Report describes the work of the present inventors, and therefore, does not qualify as prior art against the present application.

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The Examiner also made the following statement: "Some subject matter of the Keim HP Technical Report may have no bearing to the subject matter of the claimed invention, and thus Krug's possible contribution to the Keim HP Technical Report may have no bearing with the claimed subject matter." *Id.* at 7. This statement by the Examiner is completely irrelevant to the issue of whether the Keim HP Technical Report qualifies as prior art against the present application.

With respect to Appellant's citation of *In re Facius*, the Examiner made the curious comment that "Applicant apparently cited a C.C.P.A. case against himself." 9/5/2007 Office Action at 9. Appellant has not cited a case against himself, and in fact, is merely pointing to a passage of *In re Facius* that recognizes that an author (Dewey) that was not even listed as an inventor on the application that was being rejected (which named only Mathews as the inventor) was disqualified as prior art using an affidavit. *In re Facius*, 408 F.2d at 1356. Note that in this case, the prior reference had an author (Dewey) that was not even listed as an inventor on the application that was being rejected (which named only Mathews as the inventor). However, the court in *In re Facius* stated that an affidavit filed by Dewey stating that the relevant, unclaimed subject matter disclosed in the prior reference was not invented by Dewey, but was first disclosed to Dewey by Mathews, would be sufficient to overcome the § 102 rejection. *Id.*

The Examiner also made much of the fact that the Keim HP Technical Report is not fully described in the present application, and that the Keim HP Technical Report has differences from the present application. 9/5/2007 Office Action at 10. The Keim HP Technical Report is a scientific article, whereas the present application is a legal document. However, a review of the Keim HP Technical Report and the present application would reveal that the core subject matter

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as described in the present application is identical to the core content of the Keim HP Technical Report.

The Examiner also made the statement that the Rule 132 Declaration “speculated” about various matters. 9/5/2007 Office Action at 10. The assertion that the statements made in the Rule 132 Declaration are “speculated” is clearly unfounded, as the persons providing the statements in the Rule 132 Declaration are persons with *direct personal knowledge* of the content of the Keim HP Technical Report and the content of the present application. The Examiner has cited to no evidence that would contradict the statements made in the Rule 132 Declaration. Since the Rule 132 Declaration is the only competent (uncontradicted) evidence of record, disregarding such evidence as performed by the Office Action constitutes clear error. As noted by the M.P.E.P., an “uncontradicted ‘unequivocal statement’ from the applicant regarding the subject matter disclosed in an article, patent, or published application will be accepted as establishing inventorship.” M.P.E.P. § 716.10, at 700-303.

In view of the foregoing, reversal of all of the rejections based on the Keim HP Technical Report is respectfully requested.

B. Claims 44-48, 50, 53, 54, 56, 59, 60, And 63-90 Were Rejected Under 35 U.S.C. § 102 As Anticipated By M. Ankerst Et Al., “Towards An Effective Cooperation Of The Computer And The User For Classification,” Proc. 6th Int. Conf. On Knowledge Discovery And Data Mining (Ankerst).

1. Claims 44-48, 50, 53, 54, 56, 59, 60, 65-69, 71-76, 78-80, 83-88.

All claims were also rejected as anticipated by Ankerst.

Claim 44 is not anticipated by Ankerst.

Claim 44 recites constructing a pixel bar chart by partitioning the record-assigned pixels into groups along a first axis of the pixel bar chart according to a first dividing attribute,

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partitioning the record-assigned pixels in the groups into sub-groups along a second axis of the pixel bar chart according to a second dividing attribute, and after partitioning into the sub-groups, sorting, in each of the sub-groups, the record-assigned pixels according to a first ordering attribute along the first axis of the pixel bar chart, and according to a second ordering attribute along the second axis of the bar chart.

As disclosing the first partitioning task of claim 44, namely "partitioning the record-assigned pixels into groups along a first axis of the pixel bar chart according to a first dividing attribute," the Examiner stated that Figs. 4 and 5 of Ankerst disclose pixels "organized into groups along the y-axis in accordance with the categorical attribute numbers" 9/5/2007 Office Action at 27. The reference to "categorical attribute numbers" appears to refer to the numbers such as 1, 2, 61, 85, 90, and 120 in Figs. 3 and 5 of Ankerst. The "groups" along the y-axis referenced by the Examiner appears to be the different rows (or bars) depicted in Figs. 3 and 5 of Ankerst. The different rows representing different attributes depicted in Figs. 3 and 5 of Ankerst do not constitute partitioning record-assigned pixels into groups along a first axis of the pixel bar chart according to a first dividing attribute (note singular sense). All that is occurring in Figs. 3 and 5 of Ankerst is the provision of different "areas of the screen" to represent "different attributes." Ankerst, p. 3. Thus, there is no ordering of pixels according to any single attribute depicted in Fig. 3 or 5 of Ankerst. For example, the provision of the rows in Fig. 3 of Ankerst are for **multiple** different attributes; there is no ordering of pixels along the y-axis of Fig. 3 according to any single attribute, such as attribute 61, 85, 90, or 120 in Fig. 3 of Ankerst.

A further element of claim 44 is that after partitioning into the sub-groups, sorting is performed in each of the sub-groups, with the record-assigned pixels sorted according to a first ordering attribute along the first axis of the pixel bar chart, and according to a second ordering

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attribute along the second axis of the pixel bar chart. As disclosing this feature, the Examiner stated that the ordering of pixels within each sub-group is "in accordance with the categorical attribute numbers and the first group of the class partitions is ordered in the lower level and the second group of the class partitions is ordered in the upper level" 9/5/2007 Office Action at 27. Again, the statement that ordering is in accordance with the categorical attribute numbers does not disclose sorting record-assigned pixels within each sub-group according to a first ordering attribute.

Moreover, an even more fundamental error made by the Examiner is that there is no disclosure in Ankerst of sorting record-assigned pixels within each sub-group according to a second ordering attribute along the second axis of the pixel bar chart. The Examiner stated that Figs. 3-5 and 7 of Ankerst "discloses the second ordering attribute on the x-axis, e.g., the second ordering attribute ordered according to the attribute values following into Class A, Class B, or Class C by splitting the pixels into the set of class partitions in accordance with the splitting attribute wherein the second ordering attribute is the class partition attribute or the splitting attribute characterized by the categorical attribute numbers following into the class partitions." 9/5/2007 Office Action at 28. Note that the ordering of pixels along each row in Fig. 3 is according to the corresponding attribute of that row. For example, the ordering of pixels in the last row of Fig. 3 of Ankerst is according to attribute 120. Similarly, the ordering of pixels in the row corresponding to attribute 90 would be according to attribute 90. The Examiner has apparently identified parts of multiple rows depicted in Figs. 3 and 5 as being a sub-group; however, since the multiple rows are ordered according to different attributes along the x-axis, it would be impossible for Ankerst to order pixels in each of the sub-groups (which was asserted

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by the Office Action as including parts of multiple rows) according to *a* second ordering attribute along the second axis of the pixel bar chart.

It is noted that claim 44 specifically recites that in each sub-group, pixels are sorted according to a first ordering attribute along the first axis and according to a second ordering attribute along the second axis. Thus, any single row depicted in Fig. 4 or 5 of Ankerst cannot constitute the sub-group of claim 44, since such a single row does not have pixels ordered according to two different attributes along two different axes. Therefore, under the Examiner's application of the claim language onto Ankerst, multiple rows must be considered a sub-group. However, if multiple rows are considered to make up a sub-group, then there cannot be ordering of pixels according to *a* second ordering attribute along the second axis. Instead, there are multiple orderings according to multiple attributes if multiple rows are considered to make up a single sub-group.

In fact, as taught by Ankerst, each attribute of the training data is visualized in a separate area of the screen (*see* Section 3.1 on page 3 of Ankerst), and each attribute is sorted separately and independently as depicted in Fig. 2 of Ankerst. As stated by Ankerst, "[e]ach attribute is visualized independently from the other attributes in a separate bar. Figure 2 illustrates the method of the bar visualization for the case of two attributes." Ankerst, page 3, left column, last paragraph. As further stated by Ankerst, "[e]ach attribute is sorted separately and the induced order is used for the arrangement of the pixels." *Id.*, right column, second paragraph.

The Examiner disagreed with Appellant's statement that within each row, the pixels of the row are according to the numerical attribute of that row. 9/5/2007 Office Action at 12. The Examiner stated that the pixels in each bar (group) are ordered in accordance with the splitting attributes, rather than the categorical attribute. *Id.* This does not find support in Ankerst, as

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Ankerst makes it clear that within each bar, pixels are ordered according to the categorical attribute of that bar. *See* Ankerst, page 3.

In view of the foregoing, it is respectfully submitted that claim 44 is not anticipated by Ankerst.

Independent claims 50 and 56 are similarly allowable over Ankerst.

Dependent claims of claims 44, 50, and 56 are also allowable for the same reasons.

Reversal of the final rejection of the above claims is respectfully requested.

2. Claims 63, 70, 77.

Dependent claims 63, 70, and 77 depend from claims 44, 50, and 56, respectively, and therefore are allowable for at least the same reasons as corresponding independent claims.

Moreover, claim 63 further recites that sorting the record-assigned pixels in each sub-group according to the first and second ordering attributes comprises performing a two-dimensional sort of the record-assigned pixels in each sub-group.

As explained above, each sub-group, according to the reading of the Examiner, must include multiple rows – otherwise, the language of claim 63 that the pixels are sorted in each sub-group according to first and second ordering attributes along two axes cannot be satisfied if just one row is considered to be a sub-group. However, if multiple rows are considered to make up a sub-group, then the multiple rows would perform ordering along the x-axis according to different attributes. Thus, there would be one ordering according to one attribute along the y-axis of Ankerst, and separate orderings in different rows according to two different attributes in the x-axis. This would result in a three-dimensional sort, not a two-dimensional sort. Therefore, this is a further reason that claim 63 is not anticipated by Ankerst.

Claims 70 and 77 are allowable for similar reasons.

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Reversal of the final rejection of the above claims is respectfully requested.

3. Claim 64.

Claim 64 depends from claim 44, and is allowable for at least the same reasons as claim 44. Moreover, claim 64 recites determining a first one-dimensional histogram for the first ordering attribute, and a second one-dimensional histogram for the second ordering attribute. The record-assigned pixels in each sub-group are sorted based on the first and second one-dimensional histograms.

With respect to the subject matter of claim 64, the Examiner identified the categorical attribute numbers of Figs. 2-5 of Ankerst, and the splitting attributes of Ankerst. However, nowhere in Ankerst is there any reference to histograms for first and second ordering attributes. A histogram is a representation of a frequency distribution that has bars having heights proportional to class frequencies. There is not concept of histograms taught by Ankerst.

Therefore, reversal of the final rejection of the above claim is respectfully requested.

4. Claims 81, 82, 89, 90.

Independent claim 81 is also allowable over Ankerst, which fails to disclose assigning records to respective data points of a pixel bar chart, and partitioning the data points into groups and sub-groups according to respective first and second dividing attributes. Nor does Ankerst disclose sorting, in each sub-group, the data points according to first and second ordering attributes along first and second axes.

Claim 81 and its dependent claims are there allowable over Ankerst.

Reversal of the final rejection of the above claims is respectfully requested.

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C. Claims 44-48, 50, 53, 54, 56, 59, 60, And 63-82 Were Rejected Under 35 U.S.C. § 102 As Anticipated By M.C. Hao Et Al., "Visual Mining Of E-Customer Behavior Using Pixel Bar Charts," HP Technical Report, June 20, 2001 (Hao HP Technical Reference).

1. Claims 44-48, 50, 53, 54, 56, 59, 60, 63-80.

Certain claims were also rejected as being anticipated by the Hao HP Technical Report.

Appellant respectfully disagrees.

As disclosing the partitioning of record-assigned pixels into groups along a first axis of the pixel bar chart according to a first dividing attribute, as recited in claim 44, the Examiner cited the dividing along the x-axis such as "month," as depicted in Figs. 1, 2, 4, 5, and 6 of the Hao HP Technical Report. 9/5/2007 Office Action at 35.

As disclosing the second partitioning clause, namely partitioning the record-assigned pixels in the groups into sub-groups along a second axis of the pixel bar chart according to a second dividing attribute, the Examiner cited page 3 of the Hao HP Technical Report, and specifically to the passage on page 3 that refers to "ordering of pixels (y-axis) is based on attribute values, e.g., purchase amount or search type." *Id.* Note that the statement in the cited passage of the Hao HP Technical Report is *ordering* of pixels in the y-axis based on attribute values, not "partitioning" of the pixels along the y-axis. Therefore, the citation of this passage of page 3 of the Hao HP Technical Report as disclosing the second partitioning clause of claim 44 is in error.

The Examiner also cited Fig. 2 of the Hao HP Technical Report on page 2, which depicts a "pixel bar chart construction." The Examiner stated that the "sub-groups are the clusters of pixels having the same attribute values of the second ordering attribute and the second ordering attribute is the same as the second dividing attribute." *Id.* Note, however, that the specific pixel bar chart construction as described in Section 3.1 of the Hao HP Technical Report refers to

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(1) dividing the x-axis space by grouping the pixels into rectangles according to the grouping attribute (*e.g.*, months); (2) filling the rectangles with pixels from the bottom and placing them in the order inside each rectangle according to the pixel ordering attribute (*e.g.*, dollar amount for y-ordering and number of visits for the x-ordering); and (3) coloring the pixels according to the pixel coloring attribute. In the construction of the pixel bar chart of Fig. 2 described in the Hao HP Technical Report, there is only one partitioning, along the x-axis for different months. There is no partitioning along the y-axis. Instead, along the y-axis, each rectangle corresponding to the partitions along the x-axis are filled with pixels and ordered according to an ordering attribute.

In response to the foregoing arguments, the Examiner argued that claims are to be given their broadest reasonable interpretation in view of the supporting disclosure. *Id.* at 15. Equating “ordering” in the Hao HP Technical Report with “partitioning” in the claims is **unreasonable**. Note that claim 44, for example, recites both “partitioning” and “sorting,” which is a form of ordering. Thus, claim 44 itself has made a specific and express distinction between partitioning and ordering. The Examiner has ignored this specific distinction made in the claim itself. Instead, the Examiner has taken an unreasonable position.

In view of the foregoing, it is clear that claim 44 and its dependent claims are allowable over the Hao HP Technical Report. Independent claims 50 and 56, and their corresponding dependent claims, are also similarly allowable over the Hao HP Technical Report.

Reversal of the final rejection of the above claims is respectfully requested.

2. Claims 81, 82.

Independent claim 81 is allowable over the Hao HP Technical Report for similar reasons as claim 44. Claim 81 specifically recites “partitioning” and “sorting,” which provides an express distinction between the concept of “partitioning” and “sorting.” In equating “ordering”

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as taught by the Hao HP Technical Report, with the "partitioning" recited in claim 81, the Examiner has ignored the express distinction made in the claim regarding the partitioning and sorting concepts.

For the foregoing reasons, it is respectfully submitted that claim 81 and its dependent claims are allowable over the Hao HP Technical Report.

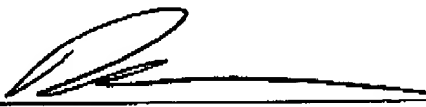
Reversal of the final rejection of the above claims is respectfully requested.

CONCLUSION

In view of the foregoing, reversal of all final rejections and allowance of all pending claims is respectfully requested.

Respectfully submitted,

Date: Jan. 9, 2008



Dan C. Hu
Registration No. 40,025
TROP, PRUNER & HU, P.C.
1616 South Voss Road, Suite 750
Houston, TX 77057-2631
Telephone: (713) 468-8880
Facsimile: (713) 468-8883

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VIII. APPENDIX OF APPEALED CLAIMS

The claims on appeal are:

- 1 44. A method executed by a computer to form a pixel bar chart for display on a display
2 monitor, comprising:
3 obtaining a set of records, each record comprising a plurality of attributes;
4 assigning a pixel to each of said records to provide record-assigned pixels, wherein every
5 such record-assigned pixel in the chart is assigned to a different record; and
6 constructing the pixel bar chart by:
7 partitioning the record-assigned pixels into groups along a first axis of the pixel
8 bar chart according to a first dividing attribute;
9 partitioning the record-assigned pixels in the groups into sub-groups along a
10 second axis of the pixel bar chart according to a second dividing attribute;
11 after partitioning into the sub-groups, sorting, in each of the sub-groups, the
12 record-assigned pixels according to a first ordering attribute along the first axis of the pixel bar
13 chart, and according to a second ordering attribute along the second axis of the pixel bar chart,
14 wherein each record-assigned pixel is adjacent at least one other record-assigned pixel.
- 1 45. The method of claim 44 further comprising, for each record-assigned pixel, assigning a
2 selectable visual indicator to the record-assigned pixel based on an attribute value of each record
3 so that some pixels have a different visual indicator than other pixels.
- 1 46. The method of claim 45 wherein the visual indicator comprises color.
- 1 47. The method of claim 44 wherein said records are obtained from a multidimensional data
2 set, and said method further comprises assigning a selectable visual indicator to each
3 record-assigned pixel based on an attribute of each record so that some pixels have a different
4 visual indicator than other pixels.

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1 48. The method of claim 44 wherein the pixel bar chart comprises a plurality of columns
2 corresponding to the groups, each column comprising a plurality of pixels and having a width
3 measured in terms of pixels, and the method further comprises causing the width of at least one
4 column to be different than the width of at least one other column.

1 50. A computer-readable storage medium having computer-readable program code embodied
2 therein that is adapted to be executed by a computer to implement a method to form a pixel bar
3 chart for display on a display monitor, the method comprising:

4 obtaining a set of records, each record comprising a plurality of attributes;

5 assigning a pixel to each of said records to provide record-assigned pixels, wherein every
6 such record-assigned pixel in the chart is assigned a different record; and

7 constructing the pixel bar chart by:

8 partitioning the record-assigned pixels into groups along a first axis of the pixel
9 bar chart according to a first dividing attribute;

10 partitioning the record-assigned pixels in the groups into sub-groups along a
11 second axis of the pixel bar chart according to a second dividing attribute;

12 after partitioning the record-assigned pixels into the sub-groups, sorting, in each
13 of the sub-groups, the record-assigned pixels according to a first ordering attribute along the first
14 axis, and sorting, within each sub-group, the record-assigned pixels according to a second
15 ordering attribute along a second axis, wherein each record-assigned pixel is adjacent at least one
16 other record-assigned pixel.

1 53. The computer-readable storage medium of claim 50 wherein said records are obtained
2 from a multidimensional data set, and said method further comprises assigning a selectable
3 visual indicator to each record-assigned pixel based on an attribute of each record so that some
4 pixels have a different visual indicator than other pixels.

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1 54. The computer-readable storage medium of claim 50 wherein the pixel bar chart
2 comprises a plurality of columns that correspond to the groups, each column comprising a
3 plurality of pixels and having a width measured in terms of pixels, and the method further
4 comprises causing the width of at least one column to be different than the width of at least one
5 other column.

1 56. A computer system, comprising:
2 a bus;
3 a display device coupled to said bus;
4 a computer-readable memory coupled to said bus; and
5 a processor coupled to said bus, said processor executes a method for constructing a pixel
6 bar chart for display on the display device, said method comprising:
7 obtaining a set of records, each record comprising a plurality of attributes;
8 assigning a pixel to each of said records to provide record-assigned pixels,
9 wherein every such record-assigned pixel in the chart is assigned a different record; and
10 constructing the pixel bar chart by:
11 partitioning the record-assigned pixels into groups along a first axis of the
12 pixel bar chart according to a first dividing attribute;
13 partitioning the record-assigned pixels in the groups into sub-groups along
14 a second axis of the pixel bar chart according to a second dividing attribute;
15 after partitioning the record-assigned pixels into the sub-groups, sorting, in
16 each of the sub-groups, the record-assigned pixels according to a first ordering attribute along a
17 first axis, and sorting, within each sub-group, the record-assigned pixels according to a second
18 ordering attribute along a second axis, wherein each record-assigned pixel is adjacent at least one
19 other record-assigned pixel.

1 59. The computer system of claim 56 wherein said records are obtained from a
2 multidimensional data set, and said method further comprises assigning a selectable visual
3 indicator to each record-assigned pixel based on an attribute of each record so that some pixels
4 have a different visual indicator than other pixels.

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1 60. The computer system of claim 56 wherein the pixel bar chart comprises a plurality of
2 columns corresponding to the groups, each column comprising a plurality of pixels and having a
3 width measured in terms of pixels, and the method further comprises causing the width of at least
4 one column to be different than the width of at least one other column.

1 63. The method of claim 44, wherein sorting the record-assigned pixels in each sub-group
2 according to the first and second ordering attributes comprises performing a two-dimensional
3 sort of the record-assigned pixels in each sub-group.

1 64. The method of claim 44, further comprising:
2 determining a first one-dimensional histogram for the first ordering attribute, and a
3 second one-dimensional histogram for the second ordering attribute,
4 wherein sorting the record-assigned pixels in each sub-group is based on the first and
5 second one-dimensional histograms.

1 65. The method of claim 44, wherein the first and second ordering attributes are selected
2 from the plurality of attributes, and the method further comprising:
3 selecting a visual indicator attribute from the plurality of attributes, wherein the visual
4 indicator attribute is different from both the first and second ordering attributes; and
5 applying colors to the record-assigned pixels according to the visual indicator attribute
6 such that at least some of the record-assigned pixels have different colors.

1 66. The method of claim 44, wherein partitioning into sub-groups causes at least some of the
2 sub-groups to have different widths measured in terms of pixels along the first axis, and causes at
3 least some of the sub-groups to have different heights measured in terms of pixels along the
4 second axis.

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1 67. The method of claim 44, wherein sorting the record-assigned pixels in each sub-group
2 according to the first ordering attribute along the first axis comprises sorting the record-assigned
3 pixels in each sub-group according to the first ordering attribute along an x-axis, and
4 wherein sorting the record-assigned pixels in each sub-group according to the second
5 ordering attribute along the second axis comprises sorting the record-assigned pixels in each
6 sub-group according to the second ordering attribute along the y-axis.

1 68. The method of claim 44, wherein constructing the pixel bar chart further comprises
2 arranging the sub-groups in an array defined by the first and second axes.

1 69. The method of claim 68, wherein partitioning into the sub-groups causes at least some of
2 the sub-groups to have different widths measured in terms of pixels along the first axis, and
3 causes at least some of the sub-groups to have different heights measured in terms of pixels
4 along the second axis.

1 70. The computer-readable storage medium of claim 50, wherein sorting the record-assigned
2 pixels according to the first and second ordering attributes along the respective first and second
3 axes comprises performing a two-dimensional sort of the record-assigned pixels according to the
4 first and second ordering attributes.

1 71. The computer-readable storage medium of claim 50, wherein sorting the record-assigned
2 pixels in each sub-group according to the first ordering attribute along the first axis comprises
3 sorting the record-assigned pixels in each sub-group according to the first ordering attribute
4 along an x-axis, and
5 wherein sorting the record-assigned pixels in each sub-group according to the second
6 ordering attribute along the second axis comprises sorting the record-assigned pixels in each
7 sub-group according to the second ordering attribute along the y-axis.

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1 72. The computer-readable storage medium of claim 50, wherein the first and second
2 ordering attributes are selected from the plurality of attributes, and the method further comprises:
3 selecting a visual indicator attribute from the plurality of attributes, wherein the visual
4 indicator attribute is different from both the first and second ordering attributes; and
5 applying colors to the record-assigned pixels according to the visual indicator attribute
6 such that at least some of the record-assigned pixels have different colors.

1 73. The computer-readable storage medium of claim 50, wherein partitioning into the
2 sub-groups causes at least some of the sub-groups to have different widths measured in terms of
3 pixels along the first axis, and causes at least some of the sub-groups to have different heights
4 measured in terms of pixels along the second axis.

1 74. The computer-readable storage medium of claim 50, wherein constructing the pixel bar
2 chart further comprises arranging the sub-groups in an array defined by the first and second axes..

1 75. The computer-readable storage medium of claim 74, wherein partitioning into the
2 sub-groups causes at least some of the sub-groups to have different widths measured in terms of
3 pixels along the first axis, and causes at least some of the sub-groups to have different heights
4 measured in terms of pixels along the second axis.

1 76. The computer system of claim 56, wherein at least some of the sub-groups have different
2 widths measured in terms of pixels along the first axis, and at least some of the sub-groups have
3 different heights measured in terms of pixels along the second axis.

1 77. The computer system of claim 56, wherein sorting the record-assigned pixels according
2 to the first and second ordering attributes causes a two-dimensional sort of the record-assigned
3 pixels in each sub-group.

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1 78. The computer system of claim 56, wherein the first and second ordering attributes are
2 selected from the plurality of attributes, and wherein the method executed by the processor
3 further comprises:

4 selecting a visual indicator attribute from the plurality of attributes, wherein the visual
5 indicator attribute is different from both the first and second ordering attributes; and

6 applying colors to the record-assigned pixels according to the visual indicator attribute
7 such that at least some of the record-assigned pixels have different colors.

1 79. The computer system of claim 56, wherein the sub-groups of the pixel bar chart are
2 arranged in an array defined by the first and second axes.

1 80. The computer system of claim 79, wherein at least some of the sub-groups have different
2 widths measured in terms of pixels along the first axis, and at least some of the sub-groups to
3 have different heights measured in terms of pixels along the second axis.

1 81. (Previously Presented) A method executed by a computer to form a pixel bar chart for
2 display on a display monitor, comprising:

3 receiving a set of records, each record comprising a plurality of attributes;

4 assigning the records to respective data points of the pixel bar chart; and

5 partitioning the data points into groups along a first axis of the pixel bar chart according
6 to a first dividing attribute;

7 partitioning the data points in the groups into sub-groups along a second axis of the pixel
8 bar chart according to a second dividing attribute, wherein the sub-groups are arranged in an
9 array defined by the first and second axes;

10 after partitioning into the sub-groups, sorting, in each of the sub-groups, the data points
11 according to a first ordering attribute along the first axis of the pixel bar chart, and according to a
12 second ordering attribute along the second axis of the pixel bar chart.

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1 82. The method of claim 81, wherein partitioning into the sub-groups causes at least some of
2 the sub-groups to have different widths measured in terms of pixels along the first axis, and
3 causes at least some of the sub-groups to have different heights measured in terms of pixels
4 along the second axis.

1 83. The method of claim 44, wherein the first dividing attribute, second dividing attribute,
2 first ordering attribute, and second ordering attribute are distinct attributes.

1 84. The method of claim 44, wherein the first dividing attribute, second dividing attribute,
2 first ordering attribute, and second ordering attribute are selected from the plurality of attributes.

1 85. The computer-readable storage medium of claim 50, wherein the first dividing attribute,
2 second dividing attribute, first ordering attribute, and second ordering attribute are distinct
3 attributes.

1 86. The computer-readable storage medium of claim 50, wherein the first dividing attribute,
2 second dividing attribute, first ordering attribute, and second ordering attribute are selected from
3 the plurality of attributes.

1 87. The computer system of claim 56, wherein the first dividing attribute, second dividing
2 attribute, first ordering attribute, and second ordering attribute are distinct attributes.

1 88. The computer system of claim 56, wherein the first dividing attribute, second dividing
2 attribute, first ordering attribute, and second ordering attribute are selected from the plurality of
3 attributes.

1 89. The method of claim 81, wherein the first dividing attribute, second dividing attribute,
2 first ordering attribute, and second ordering attribute are distinct attributes.

1 90. The method of claim 81, wherein the first dividing attribute, second dividing attribute,
2 first ordering attribute, and second ordering attribute are selected from the plurality of attributes.

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IX. EVIDENCE APPENDIX

Declaration Under 37 C.F.R. § 1.132, dated March 20, 2007. This Declaration was acknowledged by the Examiner in the Office Action dated May 8, 2007.

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X. RELATED PROCEEDINGS APPENDIX

None.